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Case Reports

***Listeria monocytogenes* meningitis, Ft. Bragg, North Carolina**

A 2-year-11-month-old, previously healthy, girl residing in Fayetteville, North Carolina presented to Womack Army Medical Center (WAMC) on 5 February 1996 with a three-day history of lethargy, nausea, vomiting, dehydration, and fever up to 104°. She was responsive only to painful stimulus and showed little improvement with fluid resuscitation. Before admission she lived off-base with her older sibling, mother, and father, who is active-duty Army. Her admission physical revealed lymphadenopathy and nuchal rigidity but no evidence of upper respiratory symptoms, cough, or localized pain. Her white blood cell (WBC) count was 18,800/cu.mm with 85% segmented neutrophils and a serum sodium of 123 mg/dl. A lumbar puncture revealed 291 WBCs (82% segmented neutrophils, 18% lymphocytes), 63 RBCs, protein 159 mg/dl, glucose 29 mg/dl. Gram stain revealed a high number (2+) of Gram positive rods. She was treated with ceftriaxone (600 mg IV bid), decadron, and acyclovir. She was transferred to the pediatric intensive care unit at Duke University Hospital where she was intubated and hyperventilated because of increased intracranial pressure. A cranial CT scan revealed no evidence of an abscess, mass effect, cerebral edema, or herniation. When the CSF culture from WAMC grew *Listeria monocytogenes*, antibiotic therapy with ceftriaxone was discontinued and replaced with ampicillin (400mg/kg/d in q 4h r), and gentamycin (7.5 mg/kg/day IV q 8hr). The hyponatremia, complicated by the syndrome of inappropriate anti-diuretic hormone secretion (SIADH), was handled with fluid restriction and resolved.

On 7 February 1996, the child's neurologic status improved and she was extubated. Two days later, 9 February, she spiked a fever of 103° and became less responsive. An emergent CT scan revealed a communicating hydrocephalus (panventriculomegaly), and her neurosurgeon placed a ventriculostomy. Vancomycin 40 mg/kg/day IV q 6hr was added to her antibiotic regimen and she was placed on ventilatory support until 13 February. On 14 February, a neurological exam revealed nonreactive pupils with disconjugate gaze. A consulting ophthalmologist determined that she had developed cortical visual impairment.

The child was discharged on 26 February 1996 in stable condition but with persistent cortical blindness, motor deficits, and verbal language deficits. Occupational therapy, and social work resources were arranged for follow-up care at home and on an outpatient basis at WAMC. An investigation to identify the

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source of the infection (testing of asymptomatic family members, environmental sources, and food products) was inconclusive.

Information on case report provided by Mr. Robert Oyler, PA-C, Preventive Medicine Service, Womack Army Medical Center, Ft Bragg, North Carolina

Editorial comments: *Listeria monocytogenes*, a common environmental organism and the etiologic agent of listeriosis, has been recognized as a human pathogen for over 50 years. It is a gram-positive rod-shaped bacterium that grows in temperatures ranging between 1 and 45°C. Most human infections are caused by strains belonging to serotypes 1/2a, 1/2b, and 4b. In 1993, the incidence of listeriosis in the US population was 4.2 cases/million with 248 deaths. The disease

usually occurs as sporadic, isolated cases at anytime of the year, however, several outbreaks have been recognized in recent years.

One uncommon aspect of this case is the age of the child, since most patients are neonates, pregnant women, immunocompromised hosts or the elderly. Infections in children her age more typically present as focal infections. In this age-group, the case-fatality rate ranges from 20% to 40%. *Listeria monocytogenes* is now recognized as one of the organisms that can produce meningitis in normal hosts and up to 30% of infected adults may be immunocompetent.

Outbreak investigations have demonstrated that epidemic listeriosis is a foodborne disease with a median incubation period estimated at 3 weeks. Foods associated with sporadic listeriosis cases include ready-to-eat meats and soft cheeses. In

Continued on page 7

Table 1. Isolation of *Listeria monocytogenes* in Food Specimens Collected From Listeriosis Patients' Refrigerators²

CATEGORY	No. of Foods Positive (%)	No. of Foods Tested	CATEGORY	No. of Foods Positive (%)	No. of Foods Tested
Beef	50 (36)	140	Vegetables	72 (11)	683
Poultry	33 (31)	108	Fruit	5 (3)	155
Pork	26 (27)	95	Dairy	9 (2)	533
Lunch meat	18 (18)	98	Other	6 (4)	144
Seafood	7 (12)	57	Total	226 (11)	2013

Table 2. Dietary Recommendations for the Prevention of Listeriosis for Persons with Increased Susceptibility*

1. Avoid eating raw or partially cooked foods of animal origin.
2. Avoid cross-contamination between raw and cooked foods during food preparation and storage.
3. Reheat leftovers until too hot to touch.
4. Avoid soft cheeses such as feta and Mexican-style cheeses. Hard cheeses, cottage cheese, and cream cheese can be eaten without concern about the risk of listeriosis.
5. Raw vegetables should be thoroughly washed.

*Persons immunocompromised by illness or medications, pregnant women, and the elderly.

TABLE I. Cases of selected notifiable conditions, United States Army*
April, 1996

Reporting MTF/Post**	Total number of reports submitted April 1996	Environmental Injuries			Viral Hepatitis			Malaria	Varicella		
		Active Duty		CO intox.	A	B	C		Active Duty	Active Duty	Other Adult
		Heat	Cold		Cum. 1996	Cum. 1996	Cum. 1996		Cum. 1996	Cum. 1996	Cum. 1996
		Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996		Cum. 1996	Cum. 1996	Cum. 1996
NORTH ATLANTIC HSSA											
Walter Reed AMC	32	-	-	-	1	-	-	1	3	1	
Aberdeen Prov. Ground	7	-	3	-	-	-	-	-	-	-	
FT Belvoir, VA	23	-	-	-	-	-	-	-	-	-	
FT Bragg, NC	7	2	7	-	-	-	-	-	-	-	
FT Drum, NY	22	-	21	-	-	1	-	1	3	-	
FT Eustis, VA	0	-	-	-	-	-	-	-	-	-	
FT Knox, KY	37	-	2	-	-	-	4	-	-	-	
FT Lee, VA	1	-	-	-	-	-	-	-	-	-	
FT Meade, MD	0	-	1	-	-	-	1	-	8	1	
USMA, West Point, NY	0	-	-	-	-	-	-	-	-	-	
CENTRAL HSSA											
Fitzsimons AMC	4	-	-	-	-	-	-	1	-	-	
GREAT PLAINS HSSA											
Brooke AMC	0	-	-	-	-	-	-	-	-	-	
FT Carson, CO	42	-	32	-	-	-	-	-	1	-	
FT Hood, TX	64	-	1	-	-	-	-	-	4	-	
FT Leavenworth, KS	1	-	-	-	-	-	-	-	-	-	
FT Leonard Wood, MO	0	-	1	-	-	-	-	-	15	2	
FT Polk, LA	5	-	-	-	-	-	-	-	-	-	
FT Riley, KS	0	-	-	-	-	-	-	-	-	-	
FT Sill, OK	65	-	-	-	3	1	1	-	-	-	
Panama	19	2	-	-	4	1	2	-	-	-	1
SOUTHEAST HSSA											
Eisenhower AMC	25	-	-	-	-	1	-	-	-	-	
FT Benning, GA	4	2	-	-	-	-	-	-	6	-	
FT Campbell, KY	0	-	-	-	-	-	-	-	-	-	
FT Jackson, SC	82	-	-	-	-	-	-	-	-	-	
FT McClellan, AL	0	-	1	-	-	-	-	-	1	-	
FT Rucker, AL	0	-	-	-	-	-	-	-	-	-	
FT Stewart, GA	0	-	-	-	-	-	-	-	-	-	
SOUTHWEST HSSA											
Wm Beaumont AMC	44	-	-	-	1	-	-	-	-	-	
FT Huachuca, AZ	0	-	-	-	-	-	-	-	-	-	
FT Irwin, CA	0	-	-	-	-	-	-	-	-	-	
NORTHWEST HSSA											
Madigan AMC	0	-	-	-	-	-	-	-	-	-	
FT Wainwright, AK	118	-	81	-	-	-	-	-	-	-	
PACIFIC HSSA											
Tripler AMC	51	-	1	-	1	-	-	-	-	-	
OTHER LOCATIONS											
Europe	25	-	-	-	1	2	-	2	1	-	
Korea	1	-	1	-	-	2	-	-	3	-	
Total	679	6	152	0	11	8	8	5	45	5	

* Based on date of onset.

** Reports are included from main and satellite clinics. Not all sites reporting.

Date of Report: 7-May-96

TABLE I. Cases of selected notifiable conditions, United States Army* (continued)
April, 1996

Reporting MTF/Post**	Salmonellosis			Shigella			Campylobacteriosis			Tuberculosis	
	Active Duty	Other		Active Duty	Other		Active Duty	Other		Active Duty	Other
		Adult	Child		Adult	Child		Adult	Child		
	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996	Cum. 1996
NORTH ATLANTIC HSSA											
Walter Reed AMC	1	-	-	-	-	-	-	1	4	-	-
Aberdeen Prov. Ground	-	-	-	-	-	-	-	-	-	-	-
FT Belvoir, VA	-	2	1	-	-	-	-	1	2	-	-
FT Bragg, NC	-	-	2	1	-	2	-	-	1	-	-
FT Drum, NY	1	-	-	-	-	-	-	-	-	-	-
FT Eustis, VA	-	-	1	-	-	-	-	-	1	-	-
FT Knox, KY	-	1	-	-	-	-	-	-	-	-	-
FT Lee, VA	-	-	-	-	-	-	-	-	-	-	-
FT Meade, MD	-	-	-	-	-	-	-	-	-	-	-
USMA, West Point, NY	-	-	-	-	-	-	-	-	-	-	-
CENTRAL HSSA											
Fitzsimons AMC	-	-	-	-	-	-	-	-	-	-	-
SOUTH CENTRAL HSSA											
Brooke AMC	-	-	-	-	-	-	-	-	-	-	-
FT Carson, CO	-	-	1	1	-	-	-	1	-	-	-
FT Hood, TX	-	-	-	-	-	-	-	-	-	-	-
FT Leavenworth, KS	-	-	-	-	-	-	-	-	1	-	-
FT Leonard Wood, MO	-	-	1	-	-	-	-	-	-	-	-
FT Polk, LA	-	-	-	-	-	-	-	-	-	-	-
FT Riley, KS	-	-	-	-	-	-	-	-	-	-	-
FT Sill, OK	-	-	-	-	-	-	-	-	-	-	-
Panama	-	2	10	2	-	2	-	-	10	-	-
SOUTHEAST HSSA											
Eisenhower AMC	-	-	-	-	-	-	-	-	-	-	-
FT Benning, GA	-	-	-	-	-	-	-	-	-	-	-
FT Campbell, KY	-	-	-	-	-	-	-	1	1	-	-
FT Jackson, SC	-	-	-	-	-	-	-	-	-	-	-
FT McClellan, AL	-	-	-	-	-	-	-	-	-	-	-
FT Rucker, AL	-	-	-	-	-	-	-	-	-	-	-
FT Stewart, GA	-	-	-	-	-	1	-	-	-	-	-
SOUTHWEST HSSA											
Wm Beaumont AMC	-	1	1	-	-	-	-	-	-	-	-
FT Huachuca, AZ	-	-	-	-	-	-	-	-	-	-	-
FT Irwin, CA	-	-	-	-	-	-	-	-	-	-	-
NORTHWEST HSSA											
Madigan AMC	-	-	-	-	-	-	-	-	-	-	-
FT Wainwright, AK	-	-	-	-	-	-	-	1	-	-	-
PACIFIC HSSA											
Tripler AMC	-	-	1	-	-	-	-	-	-	-	-
OTHER LOCATIONS											
Europe	-	1	6	-	-	-	1	2	1	1	-
Korea	-	-	-	-	-	-	-	-	3	-	-
Total	2	7	24	4	0	5	6	10	13	4	0

* Based on date of onset.

** Reports are included from main and satellite clinics. Not all sites reporting.

Date of Report: 7-May-96

**TABLE II. Cases of notifiable sexually transmitted diseases, United States Army
April, 1996**

Reporting MTF/Post*	Chlamydia		Urethritis non-spec.		Gonorrhea		Herpes Simplex		Syphilis Prim/Sec		Syphilis Latent		Other STDs**	
	Cur. Month	Cum. 1996	Cur. Month	Cum. 1996	Cur. Month	Cum. 1996	Cur. Month	Cum. 1996	Cur. Month	Cum. 1996	Cur. Month	Cum. 1996	Cur. Month	Cum. 1996
NORTH ATLANTIC HSSA														
Walter Reed AMC	11	35	5	16	1	12	4	24	-	-	-	-	1	-
Aberdeen Prov. Ground	-	4	3	6	3	8	-	-	-	-	-	-	-	-
FT Belvoir, VA	12	22	-	-	2	5	-	-	-	-	-	-	-	-
FT Bragg, NC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Drum, NY	5	20	-	9	4	23	2	8	-	-	-	-	-	1
FT Eustis, VA	-	14	-	-	-	7	-	-	-	-	-	-	-	-
FT Knox, KY	14	45	-	-	4	21	8	23	-	-	-	-	-	-
FT Lee, VA	6	35	-	1	4	18	-	1	-	-	-	-	-	-
FT Meade, MD	-	3	-	7	-	3	-	4	-	-	-	-	-	-
USMA, West Point, NY	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CENTRAL HSSA														
Fitzsimons AMC	-	1	-	-	-	-	-	-	-	-	1	1	-	-
SOUTH CENTRAL HSSA														
Brooke AMC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Carson, CO	26	84	24	88	6	26	1	14	-	-	-	-	1	-
FT Hood, TX	36	144	20	35	17	39	5	16	-	1	-	-	-	-
FT Leavenworth, KS	1	3	-	-	-	1	-	3	-	-	-	-	-	-
FT Leonard Wood, MO	-	22	-	13	-	9	-	1	-	-	-	-	-	-
FT Polk, LA	1	23	-	-	1	12	1	2	-	-	-	-	-	-
FT Riley, KS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Sill, OK	8	56	2	11	6	23	4	9	-	-	-	-	2	3
Panama	7	37	-	-	1	3	-	3	-	-	-	-	-	6
SOUTHEAST HSSA														
Eisenhower AMC	9	37	-	1	2	12	-	25	-	1	-	-	-	-
FT Benning, GA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Campbell, KY	13	136	-	-	1	38	-	10	1	3	-	-	1	1
FT Jackson, SC	47	187	-	-	3	11	1	11	-	-	-	-	1	1
FT McClellan, AL	-	5	-	-	-	4	-	-	-	1	-	-	-	-
FT Rucker, AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Stewart, GA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SOUTHWEST HSSA														
Wm Beaumont AMC	15	68	-	-	1	9	1	21	-	-	-	-	-	1
FT Huachuca, AZ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Irwin, CA	-	5	-	-	-	2	-	-	-	-	-	-	-	-
NORTHWEST HSSA														
Madigan AMC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FT Wainwright, AK	3	14	-	-	-	2	1	2	-	-	-	-	-	-
PACIFIC HSSA														
Tripler AMC	22	72	-	-	7	21	9	36	-	-	-	2	-	-
OTHER LOCATIONS														
Europe	-	16	-	-	-	2	-	2	-	-	-	-	-	2
Korea	1	4	-	-	-	2	-	2	-	-	-	-	1	2
Total	237	1092	54	187	63	313	37	217	1	6	1	5	5	17

* Reports are included from main and satellite clinics. Not all sites reporting.

Date of Report: 7-May-96

** Other STDs: (a) Chancroid (b) Granuloma Inguinale (c) Lymphogranuloma Venereum (d) Syphilis unspes. (e) Syph, tertiary (f) Syph, congeni

Continued from page 3

a 1992 microbiologic survey by Pinner et al (see Table 1), it was found that twenty-six (33%) of 79 refrigerators with foods that grew *L. monocytogenes* contained at least one food isolate of the same strain as that in the corresponding patient with Listeriosis, a frequency much higher than would be expected by chance ($P < .001$).

Dietary recommendations for the prevention of listeriosis are included in Table 2³.

Editorial comment submitted by CDR Aileen M. Marty, MC, USN, Chief, Infectious Disease Branch, Armed Forces Institute of Pathology

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2. Pinner RW, Schuchat A, Swaminathan B, Hayes PS, et al. Role of Foods in Sporadic Listeriosis Microbiologic and Epidemiologic Investigation. JAMA. 1992;267:2047.
3. Schuchat A, Deaver KA, Wenger JD, et al. Role of Foods in Sporadic Listeriosis Case-Control Study of Dietary Risk Factors. JAMA. 1992;267:2045

Report from the field

***Strongyloides stercoralis* hyperinfection, Fort Drum, New York**

A 35 year old black female family member moved to the United States from Zaire in 1989 and to Fort Drum in January 1994.

In February 1994, she presented for care with complaints of perianal itching and blood per rectum. She was diagnosed and treated symptomatically for hemorrhoids. In May 1994, she was seen again complaining of a five year history of diarrhea, intermittent cramping, and rectal bleeding. Stool culture and examination for ova and parasites were negative. Sedimentation rate was slightly elevated, and complete blood count (CBC) revealed iron deficiency anemia and eosinophilia (27%). She was diagnosed with possible irritable bowel syndrome.

In June 1994, she was referred to a civilian surgeon for colonoscopy. A biopsy revealed "severe chronic colitis" and "multinucleated giant cells suspicious of granulomatous colitis (Crohn's)." During therapy appropriate for Crohn's disease, the patient continued to have bleeding, abdominal pain, and perianal itching.

In December 1995, the patient sought care for abdominal pain. At the

time, she was taking prednisone 20 mg twice a day. She was diagnosed and treated for a urinary tract infection. In January 1996, she returned for followup with a three week history of abdominal pain, nausea, and diarrhea. Her abdomen was tender, and her stool was trace heme positive. A CBC was normal and an abdominal X-ray revealed air fluid levels. She was diagnosed with adynamic ileus and Crohn's disease and placed on a clear liquid diet.

In February 1996, she was referred to a local civilian hospital with worsening abdominal pain. She was treated with IV and oral steroids. Four days after admission, she developed respiratory distress. She was placed on inhaled steroids. A

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Table 3. Antiparasitic Agents for the Treatment of *Strongyloides stercoralis**

Thiabendazole (Mintezol)	22mg/kg po bid	2 days
Albendazole (Zentel)	400mg po qd	3 days
Ivermectin (Mectizan)	200 µg/kg po qd	2 days

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CT scan of the abdomen revealed what appeared to be a toxic megacolon. Ten days after admission, an exploratory laparotomy was performed. The full-thickness biopsy of the cecum revealed many *Strongyloides stercoralis* larvae.

Postoperatively, the patient's condition deteriorated and she required ventilatory support. In the weeks following surgery her temperature fluctuated up to 104°F. Her WBC counts ranged between 10,000-20,000/cu.mm. with an eosinophilia of 10-25%, blood and CSF cultures were negative. She was treated with antibiotics for *Pseudomonas aeruginosa* pneumonia. She developed a pneumothorax during insertion of a central venous line. A tracheostomy was placed, and she required packed RBCs for a hematocrit of 26%.

Motile *Strongyloides stercoralis* larvae were seen in large numbers in both sputum and stool specimens. She was treated with thiabendazole,

and after two weeks of therapy, motile larvae were no longer seen in her stool specimen. She required an additional week of thiabendazole for her sputum to clear. Her eosinophils dropped to 3-5% of a normal CBC.

The patient no longer requires ventilatory support and her condition is slowly improving. She remains in the hospital while recovering from the complications of her surgery. Her family members were screened and all stool specimens were negative for ova and parasites.

Of note, there is no mention in the outpatient record that she is a native of Zaire.

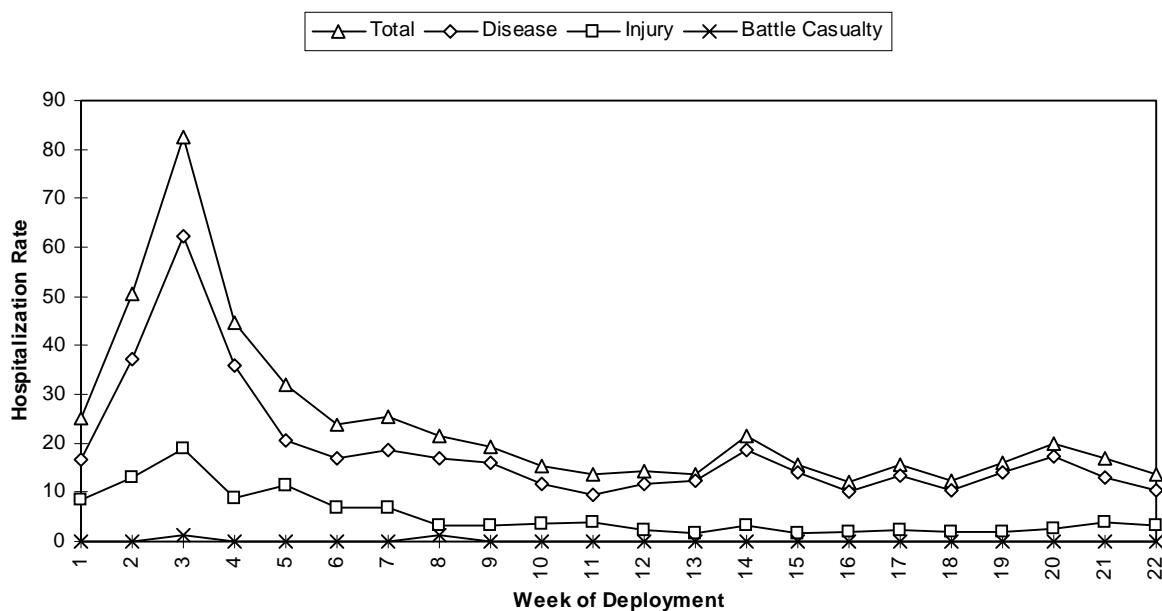
Submitted by MAJ L Keep, MC, Chief, Preventive Medicine Service, Fort Drum, NY

Editorial Comment: *Strongyloides stercoralis* is a nematode parasite that is found in most tropical and sub-tropical areas of the world and is highly prevalent

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Surveillance Trends, Bosnia

Active Duty Hospitalization Rates*, Operation Joint Endeavor



* Rates are calculated per 1000 soldiers per week

Source: PARRTS Data, USA Patient Administration and Biostatistical Activity, Fort Sam Houston, TX

Bosnia Update**TABLE III. Active Duty Hospitalization Rates*, Operation Joint Endeavor, 11Dec95 - 18May96**

ICD-9 Category	Males							Females							All
	< 20	20-24	25-29	30-34	35-39	>= 40	Total M	< 20	20-24	25-29	30-34	35-39	>= 40	Total F	
Infectious and Parasitic Diseases	27.5	10.6	8.4	7.9	3.6	3.8	8.8	0.0	12.6	12.6	34.1	0.0	0.0	13.7	9.3
Neoplasms	4.6	0.4	0.0	0.7	0.0	0.0	0.4	0.0	0.0	0.0	0.0	11.2	0.0	1.1	0.5
Endocrine, Nutritional, and Metabolic Disease and Immunity Disorders	0.0	0.0	1.3	0.0	0.0	0.0	0.4	0.0	0.0	0.0	13.6	0.0	0.0	2.3	0.6
Diseases of the Blood and Blood-Forming Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mental Disorders	9.2	5.9	2.6	2.9	1.2	0.0	3.6	0.0	9.5	25.2	0.0	0.0	0.0	10.3	4.3
Diseases of the Nervous System and Sense Organs	13.8	2.6	2.6	1.4	1.2	5.7	2.8	0.0	6.3	21.0	13.6	11.2	0.0	11.4	3.6
Diseases of the Circulatory System	0.0	2.9	4.0	5.8	9.5	7.6	4.6	0.0	0.0	4.2	0.0	0.0	0.0	1.1	4.3
Diseases of the Respiratory System	0.0	7.3	5.7	4.3	4.8	13.3	6.3	0.0	25.3	8.4	0.0	22.5	17.6	14.9	7.1
Diseases of the Digestive System	13.8	18.0	10.6	10.1	4.8	15.2	12.8	108.5	22.1	8.4	0.0	0.0	17.6	14.9	13.0
Diseases of the Genitourinary System	4.6	3.7	8.4	5.8	3.6	5.7	5.5	0.0	34.7	29.5	13.6	11.2	35.1	26.3	7.6
Complications of Pregnancy, Childbirth, and the Puerperium**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.5	4.2	0.0	0.0	0.0	4.6	0.5
Diseases of the Skin and Subcutaneous Tissue	9.2	2.9	2.6	2.9	0.0	0.0	2.5	0.0	0.0	0.0	6.8	0.0	0.0	1.1	2.4
Diseases of the Musculoskeletal System and Connective Tissue	9.2	8.4	11.9	13.0	8.3	11.4	10.4	0.0	9.5	4.2	0.0	22.5	17.6	8.0	10.2
Congenital Abnormalities	0.0	0.4	1.3	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Symptoms, Signs, and ill-Defined Conditions	4.6	13.2	8.8	12.3	7.2	9.5	10.7	144.7	47.4	25.2	20.5	22.5	0.0	34.3	13.0
Injury and Poisoning	22.9	23.8	19.9	22.4	11.9	3.8	19.8	36.2	53.7	16.8	13.6	11.2	0.0	28.6	20.7
All Hospitalizations	119.2	100.1	88.2	89.5	56.1	75.8	89.2	289.5	230.4	159.9	116.0	112.4	87.8	172.7	97.4

* Rates are calculated per 1000 soldiers per year based on cumulative person time.

** Includes normal delivery

Source: PARRTS Data, USA Patient Administration Systems and Biostatistical Activity, Fort Sam Houston, TX

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in Southeast Asia. It is a unique parasite with both a parasitic and free-living stage in the life cycle. In the parasitic cycle only female worms are present, living in the small intestines of humans and producing eggs by parthenogenesis. Larvae hatch from the eggs and pass with the feces. In the soil the larvae transform into the infective stage (filariform) which is able to penetrate the skin of humans. The larvae migrate through the body, pass through the lungs and then to the intestines. Some larvae in the feces form into free-living adult males and females. The females produce embryonated eggs that hatch and release the rhabditiform larvae that develop into infective forms. The parasite is also able to reproduce in humans (autoinfection), which leads to hyperinfection. Infections in humans have been known to persist for 30 or more years.

The prevalence of strongyloidiasis is not known

since the diagnosis is often missed in low-grade infections. A number of veterans from the China-Burma-India theater of operations during World War II acquired the parasitosis which was not recognized until years later when they were treated for cancer at Veterans Administration Hospitals. Chemotherapeutic agents lowered resistance and the parasite disseminated throughout the whole body. Death will result unless the individual is treated with Thiabendazole. Albendazole and Ivermectin are also effective drugs, but the former is not available in the United States; Ivermectin may only be obtained from the Centers for Disease Control in Atlanta, Georgia.

Editorial comment submitted by Dr. John H. Cross, PhD Professor, Tropical Public Health, Department of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences

Case Reports

Kawasaki Disease, Tripler Army Medical Center, Oahu, Hawaii

Case # 1

A 3-year-old white male presented to Tripler Army Medical Center (TAMC) in mid-January with a one week history of fever. Associated manifestations included cough, coryza, red eyes, irritability, and malaise. On examination, he had a temperature of 100.8°F with mild conjunctival injection, dry fissured lips, and hyperemic oral mucosa. A fine, erythematous, maculopapular rash involving his trunk and extremities was noted and his perineum was desquamating. No significant lymphadenopathy was noted. The white blood cell (WBC) count and differential were within normal limits. An erythrocyte sedimentation rate (ESR) was 39 mm/hr, hematocrit was 32.2% with a platelet count of

483,000/mm³. He was admitted on 16 January 1996 with the diagnosis of Kawasaki Disease (KD). Treatment with intravenous immune globulin (IVIG) and aspirin was initiated. His symptoms resolved within 24 hours. He was started on ampicillin for otitis media and discharged. Within 12 hours he returned with increased irritability and severe headache. A lumbar puncture revealed 82 WBC (88% segmented neutrophils and 8% bands). CSF and throat cultures were negative; however, the anti-DNAse B was positive at 1:480, antihyaluronidase was positive at 1:1024, and anti-streptolysin-O (ASO) titer was positive at 290. He improved slowly over 72 hours and was discharged on amoxicillin.

Case # 2

A 2-year-old, white male presented to the pediatric clinic with a 3-day history of fever and vomiting. He was diagnosed with otitis media and treated with Augmentin. His fever persisted, fluctuating to 106°F with vomiting, irritability, and anterior neck pain. He was evaluated in the emergency room where physical exam revealed tender, enlarged, anterior cervical lymph nodes, and an ataxic gait. Computerized tomography of his head and neck were negative. While in the E.R. he developed a fine, erythematous, maculopapular rash on the trunk, extremities, and face. He was started on Keflex for cervical adenitis and discharged. The following day he presented with increased irritability, fever to 101.8°F, conjunctival injection, tender left anterior cervical lymphadenopathy, hyperemic oral mucosa, fissuring of the lips, and a polymorphous rash that was confluent over his face and perineum. His WBC was 13,800/cu.mm., platelet count 334,000mm³ and ESR 97mm/hr. ASO titer and throat culture were negative and echocardiogram (ECHO) was normal.

The patient was admitted on 22 January with the diagnosis of KD, and IVIG therapy was initiated. During the first hour of administration, he developed shaking chills and pallor with acral and circumoral cyanosis. He remained normotensive. The IVIG was discontinued and bacterial contamination was ruled out. The following day, he received IVIG without complication. Resolution of all symptoms occurred within 24 hours. Desquamation of his hands, feet, and perineum was noted. Two weeks later he was asymptomatic with a normal blood count. A follow-up ECHO was normal.

Case # 3

On 2 February 1996, a 3-year-old, black male was seen in the TAMC emergency room with fever to 103°F, headache, cough, and sore throat of three days duration. He complained of difficulty swallowing and turning his head. Physical exam

was remarkable for conjunctival injection, and tender anterior cervical lymphadenopathy. Due to his irritability and neck pain, a CT scan of the head and neck was performed. A retropharyngeal phlegmon (diffuse abscess) was found. His WBC count was 18,200 cu.mm. with a shift to the left. His hematocrit was 35.5% with a platelet count of 414,000 mm³. Cultures of the CSF and urine were negative. Despite an antibiotic regimen of vancomycin, clindamycin, ceftazidime and antipyretics, he remained febrile. On the fourth hospital day he developed worsening bulbar conjunctivitis, inflammation of his oral mucosa, and fissuring of his lips. A fine, erythematous, papular rash appeared on his trunk and extremities. Palmar erythema with edema was noted. His ESR was elevated to 118mm/hr. and serology tests for streptococcal infection were negative. He developed bilateral iritis. An ECG and ECHO were within normal limits. The diagnosis of KD was made and IVIG was administered. Within 24 hours symptoms resolved, and he was discharged on 10 February 1996. On 26 February, a small aneurysm (3-3.5mm) of the left coronary artery was observed on ECHO.

Case # 4

On 5 April 1996, a 3-year-old, black female was admitted to the TAMC due to a one week history of fever to 103°F, fatigue and upper respiratory symptoms. She had a history of recurrent KD and was last hospitalized in September, 1994 with her third episode of the disease. She responded well to IVIG during her previous episodes. She was followed closely by a pediatric cardiologist for the last two years. On physical exam, she had a temperature of 101°F, slightly injected conjunctiva, and tender left cervical lymphadenopathy. She had mild palmar and plantar erythema. ESR was 72mm/hr and throat culture was negative. On hospital day two she had mild fissuring of her lips and slight hyperemia of the oral mucosa. IVIG was instituted but after 1.1 g/kg was infused, she developed shaking chills and a drop in her mean

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arterial pressure. The infusion was stopped, and she remained afebrile. Her symptoms resolved within 12 hours and she was discharged. A repeat ECHO was within normal limits.

Submitted by COL Donald A. Person, MC, Chief, Department of Pediatrics, Tripler Army Medical Center and CPT Michael P. Mulreany, MC, Resident in Pediatrics, Tripler Army Medical Center.

Editorial Comment: Since Tomisaku Kawasaki first described acute febrile mucocutaneous lymph node syndrome of childhood in 1967, tens of thousands of cases have been recognized in Japan and thousands of cases in the United States. During the late 1970's and early 1980's, large numbers of cases occurred in outbreaks. Still, the etiology of KD is unknown. While outbreaks in communities have suggested infectious etiologies, there remains no firm evidence of person to person spread, no documented value to case contact tracing, and no effective methods of preventing secondary cases.

A variety of candidate microbes including bacteria, rickettsia, and viruses have come and gone. Indeed, most children with KD are treated with antibiotics, but to no avail. After initial reports concerning corticosteroid therapy failed to show beneficial/ameliorative effects, alternative treatments were sought. Salicylate therapy was shown to be effective, and other platelet inhibitors, such as the newer and less toxic nonsteroidal anti-inflammatory drugs (NSAIDS) and dipyridamole, have been used. With improved methods of purifying immunoglobulin G preparations and the reported efficacy of such preparations in the treatment of idiopathic thrombocytopenic purpura (ITP), the way

was clear to develop treatment strategies for KD. Clinical trials of IVIG were conducted in the US and Japan. Standard of care now dictates the use of IVIG in a dosage of 2gm/kg given intravenously over several hours.

In the past decade, there appears to have been a decrease in the frequency of classic KD, especially in the US. Fewer cases are classic and more occur as forme fruste or atypical KD. This latter observation is highlighted by the cases reported at TAMC during the first four months of 1996. The side effects/toxicities of IVIG are also underscored by these cases. Case #1 was complicated by aseptic meningitis, due either to the KD (likely) or secondary to the IVIG. Case #2 was clearly atypical and first thought to be a cervical adenitis. He likewise experienced a presumptive hypersensitivity reaction after IVIG administration. Case #3 was thought to have a retropharyngeal abscess but when bilateral iritis was diagnosed and other symptomatology developed, it was clear that he had KD. In spite of appropriate therapy with IVIG, he developed a small coronary aneurysm. Case #4 is notable in that the patient was said to have had three previous episodes of KD. In spite of minimal objective findings, it was felt that the safest strategy was to treat this episode as though the child had recurrent KD. This child likewise developed hypersensitivity to the IVIG preparation and its discontinuation was required.

More studies are required to illucidate the etiology and thus to better and more specifically direct therapy. Ultimately, studies of etiologies of and risk factors for KD may lead to effective preventive strategies.

TABLE III. Reported heat and cold weather injuries, United States Army, Jan-Apr 1996*

Reporting MTF/Post**	Heat Injuries				Cold Weather Injuries							
	Heat Exhaustion		Heat Stroke		Frostbite		Hypothermia		Immersion		Unspecified	
	M	F	M	F	M	F	M	F	M	F	M	F
NORTH ATLANTIC HSSA												
Walter Reed AMC	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Prov. Ground	-	-	-	-	-	-	-	-	-	-	3	-
FT Belvoir, VA	-	-	-	-	-	-	-	-	-	-	-	-
FT Drum, NY	1	-	1	-	3	-	-	-	1	-	3	-
FT Eustis, VA	-	-	-	-	11	-	-	-	9	1	-	-
FT Knox, KY	-	-	-	-	-	-	-	-	-	-	-	-
FT Lee, VA	-	-	-	-	2	-	-	-	-	-	-	-
FT Meade, MD	-	-	-	-	-	-	-	-	-	-	-	-
USMA, West Point, NY	-	-	-	-	-	-	-	-	-	-	1	-
CENTRAL HSSA												
Fitzsimons AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Carson, CO	-	-	-	-	-	-	-	-	-	-	-	-
FT Leonard Wood, MO	-	-	-	-	-	-	-	-	-	-	-	-
FT Leavenworth, KS	-	-	-	-	22	6	-	-	-	-	4	-
FT Riley, KS	-	-	-	-	-	-	-	-	-	-	-	1
SOUTH CENTRAL HSSA												
Brooke AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Hood, TX	-	-	-	-	1	-	-	-	-	-	-	-
FT Polk, LA	-	-	-	-	-	-	-	-	-	-	-	-
FT Sill, OK	-	-	-	-	-	-	-	-	-	-	-	-
Panama	-	-	-	-	-	-	-	-	-	-	-	-
SOUTHEAST HSSA												
Eisenhower AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Benning, GA	-	-	-	-	-	-	-	-	-	-	-	-
FT Bragg, NC	-	-	2	-	-	-	-	-	-	-	-	-
FT Campbell, KY	-	-	-	-	-	-	-	-	-	-	-	-
FT Jackson, SC	-	-	-	-	-	-	-	-	-	-	-	-
FT McClellan, AL	-	-	-	-	-	1	-	-	-	-	-	-
FT Rucker, AL	-	-	-	-	-	-	-	-	-	-	-	-
FT Stewart, GA	-	-	-	-	-	-	-	-	-	-	-	-
SOUTHWEST HSSA												
Wm Beaumont AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Huachuca, AZ	-	-	-	-	-	-	-	-	-	-	-	-
FT Irwin, CA	-	-	-	-	-	-	-	-	-	-	-	-
NORTHWEST HSSA												
Madigan AMC	-	-	-	-	-	-	-	-	-	-	-	-
FT Wainwright, AK	-	-	-	-	61	15	-	-	3	-	2	-
PACIFIC HSSA												
Tripler AMC	-	-	-	-	-	-	-	-	1	-	-	-
OTHER LOCATIONS												
Europe	-	-	-	-	-	-	-	-	-	-	-	-
Korea	-	-	-	-	1	-	-	-	-	-	-	-
Total	1	0	3	0	101	22	0	0	14	1	13	1

* Army active duty cases only.

** Reports are included from parent and daughter clinics. Not all sites reporting.

Date of Report:

7-May-96

ARD Surveillance Update*Legend*

—	ARD Rate	= (ARD cases / Trainees) * 100
- - -	SASI*	= ARD Rate * Strep Rate**

FT Benning

Ft Jackson

Ft Knox

Ft Leonard
Wood

Ft McClellan

Ft Sill

Table IV. ARD surveillance rates, submitted by Army TRADOC posts

* Strep/ARD Surveillance Index (SASI)

**Strep Rate= (GABHS(+)/ Cultures) * 100

Note: SASI has proven to be a reliable predictor of serious strep-related morbidity, especially acute rheumatic fever.

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